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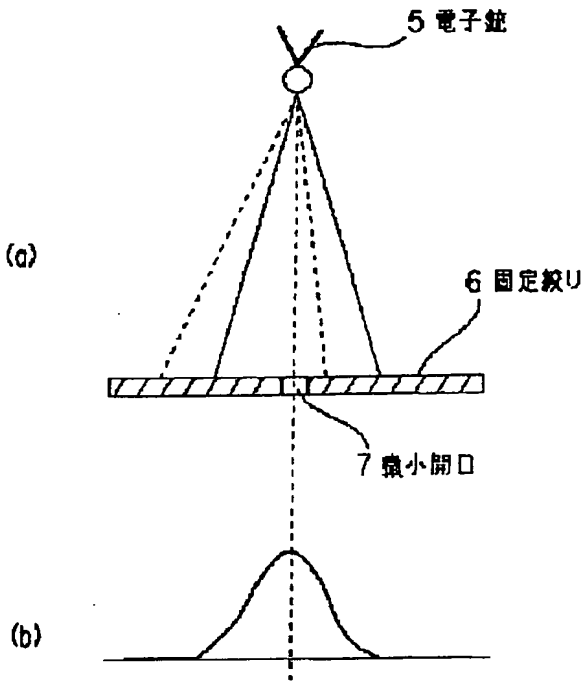
TITLE : METHOD AND APPARATUS FOR CONTROLLING CURRENT DENSITY OF ELECTRON BEAM



ABSTRACT : PROBLEM TO BE SOLVED: To control a current density of an electron beam with excellent reproducibility without varying a radiation range of the electron beam on a sample by disposing aperture means having a fine opening on an optical path of the electron beam to be emitted from an electronic gun.

SOLUTION: An electron beam emitted from an electron gun 5 is projected on a fixed beam limiting 6, passes a fine opening 7 formed at the beam limiting 6, and then, is radiated on a sample via a focusing lens. In this case, the radiated position of the electronic beam on the beam limiting 6 and the position of the opening 7 are moved relatively to each other, so that a current density of the electron beam passing the opening 7 is controlled. Consequently, it is possible to eliminate an influence of hysteresis of the focusing lens and to control the current density of the electron beam with excellent reproducibility. the radiation range of the electron beam on the sample always becomes the same despite of variation of the current density since the size of the fine opening 7 is not varied. If a deflection quantity of the electron beam is increased, the current of the electron beam passing the fine opening 7 becomes zero, thereby enlarging a dynamic range of the current density control.